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JC07 Rec'd PCT/PTO 15 NOV 2001

FORM PTO-1390 (REV 10-94)	U S DEPARTMENT OF COMMERCE PATENT AND TRADEMARK OFFICE	DOCKET #: 4925-161PUS
TRANSMITTAL LETTER TO THE UNITED STATES DESIGNATED/ELECTED OFFICE (DO/EO/US) CONCERNING A FILING UNDER 35 U.S.C. 371		
		U.S. APPLICATION NO. (If known, see 37 CFR 1.5) 09/980549
INTERNATIONAL APPLICATION NO **PCT/EP99/03516**	INTERNATIONAL FILING DATE **21 May 2000**	PRIORITY DATE CLAIMED

TITLE OF INVENTION

Adaptive Rate Matching For Data or Speech

APPLICANT(S) FOR DO/EO/US

Tommi KOISTINEN

Applicant herewith submits to the United States Designated/Elected Office (DO/EO/US) the following items and other information:

1. [x] This is a **FIRST** submission of items concerning a filing under 35 U.S.C. 371.
2. [] This is a **SECOND** or **SUBSEQUENT** submission of items concerning a filing under 35 U.S.C. 371
3. [x] This express request to begin national examination procedures (35 U.S.C. 371(f)) at any time rather than delay examination until the expiration of the applicable time limit set in 35 U.S.C. 371(b) and PCT Articles 22 and 39(1).
4. [x] A proper Demand for International Preliminary Examination was made by the 19th month from the earliest claimed priority date.
5. [x] A copy of the International Application as filed (35 U.S.C. 371(c)(2))
   a. [x] is transmitted herewith (required only if not transmitted by the International Bureau).
   b. [x] has been transmitted by the International Bureau.
   c. [] is not required, as the application was filed in the United States Receiving Office (RO/US)
6. [] A translation of the International Application into English (35 U.S.C. 371(c)(2)).
7. [x] Amendments to the International Application under PCT Article 19 (35 U.S.C. 371(c)(3))
   a. [x] are transmitted herewith (required only if not transmitted by the International Bureau). (See Reply to Written Opinion)
   b. [] have been transmitted by the International Bureau.
   c. [] have not been made; however, the time limit for making such amendments has NOT expired.
   d. [] have not been made and will not be made.
8. [] A translation of the amendments to the claims under PCT Article 19 (35 U.S.C. 371(c)(3)).
9. [x] An oath or declaration of the inventor(s) (35 U.S.C. 371(c)(4)). **Unexecuted**
10. [] A translation of the annexes to the International Preliminary Examination Report under PCT Article 36 (35 U.S.C. 371(c)(5)).

Items 11. to 16. Below concern other document(s) or information included:

11. [x] An Information Disclosure Statement under 37 CFR 1.97 and 1.98.
12. [] An assignment document for recording. A separate cover sheet in compliance with 37 CFR 3.28 and 3.31 is included.
13. [x] A **FIRST** preliminary amendment.
    [] A **SECOND** or **SUBSEQUENT** preliminary amendment.
14. [] A substitute specification.
15. [] A change of power of attorney and/or address letter.
16. [x] Other items or information *(specify):* PCT Publication Sheet, Int'l Preliminary Examination Report, Written Opinion, Reply to Written Opinion, Information Concerning Elected Offices Notified of Their Election, Notice Informing the Applicant of the Communication of the International Application to the Designated Offices, Notification of the Recording of a Change, and Notification of Receipt of Record Copy

U.S. APPLICATION NO (If known, see 37 CFR 1.5) 09/980549	INTERNATIONAL APPLICATION NO PCT/EP99/03516	ATTORNEY'S DOCKET NUMBER 4925-161PUS

17.[x]The following fees are submitted:

Basic National Fee (37 CFR 1.492(a)(1)-(5)): Search Report has been prepared by the EPO or JPO ..... **$890.00** International preliminary examination fee paid to USPTO (37 CFR 1.482)..... **$710.00** No international preliminary examination fee paid to USPTO (37 CFR 1.482) but international search fee paid to USPTO (37 CFR 1.445(a)(2))..... **$740.00** Neither international preliminary examination fee (37 CFR 1.482) nor international search fee (37 CFR 1.445(a)(2)) paid to USPTO ..... **$1040.00** International preliminary examination fee paid to USPTO (37 CFR 1.482) and all claims satisfied provisions of PCT Article 33(2)-(4) **$100.00**		
ENTER APPROPRIATE BASIC FEE AMOUNT =	**$**	890
Surcharge of **$130.00** for furnishing the oath or declaration later than [] 20 [] 30 months from the earliest claimed priority date (37 CFR 1.492(e)).	**$**	

Claims	Number Filed	Number Extra	Rate		
Total Claims	8 - 20 =		x **$18.00**	**$**	
Independent Claims	2 - 3 =		x **$84.00**	$	
Multiple dependent claim(s) (if applicable)			+ **$280.00**	**$**	

TOTAL OF ABOVE CALCULATIONS =	**$**	890
Reduction of ½ for filing by small entity, if applicable.	**$**	
SUBTOTAL =	**$**	890
Processing fee of **$130.00** for furnishing the English translation later than [] 20 [] 30 months from the earliest claimed priority date (37 CFR 1.492(f)). +	**$**	
TOTAL NATIONAL FEE =	**$**	890
Fee for recording the enclosed assignment (37 CFR 1.21(h)). The assignment must be accompanied by the appropriate cover sheet (37 CFR 3.28, 3.31). **$40.00** per property +	**$**	
TOTAL FEES ENCLOSED		$890
Amount to be refunded:		**$**
charged:		**$**

a. [x] One check in the amount of $ 890 to cover the above fees is enclosed.
b. [] Please charge my Deposit Account No. 03-2412 in the amount of $____ to cover the above fees. A duplicate copy of this sheet is enclosed.
c. [x] The Commissioner is hereby authorized to charge any additional fees which may be required, or credit any overpayment to Deposit Account No. 03-2412. A duplicate copy of this sheet is enclosed.

NOTE: Where an appropriate time limit under 37 CFR 1.494 or 1.495 has not been met, a petition to revive (37 CFR 1.137(a) or (b)) must be filed and granted to restore the application to pending status.

SEND ALL CORRESPONDENCE TO:
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Michael C. Stuart
Registration Number: 35,698 November 15, 2001
Tel: (212) 687-2770

Attorney Docket # 4925-161PUS

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re National Phase PCT Application of
Tommi KOISTINEN
International Appln. No.: PCT/EP99/03516
International Filing Date: 21 May 2000
For: Adaptive Rate Matching For Data or Speech

PRELIMINARY AMENDMENT

Assistant Commissioner for Patents
Washington, D.C. 20231
BOX PCT

S I R:

Prior to examination of the above-identified application please amend the application as follows:

In the Claims:

Please amend 3 and 8 to read as follows:

3. The interface establishing device according to claim 1, characterized in that said control means (32) is adapted to send a test packet to a predetermined destination over said network (4), receive said test packet back from said predetermined destination and analyse the delay occurred in order to determine the load on said network.

6. The method according to claim 4

characterized by further comprising the steps of

sending a test packet to a predetermined destination over said network (4);

receiving said test packet back from said predetermined destination; and

analysing the delay occurred in order to determine the load on said network.

Add the following new claims:

7. The interface establishing device according to claim 2, characterized in that said control means (32) is adapted to send a test packet to a predetermined destination over said network (4), receive said test packet back from said predetermined destination and analyse the delay occurred in order to determine the load on said network.

8. The method according to claim 5

characterized by further comprising the steps of

sending a test packet to a predetermined destination over said network (4);

receiving said test packet back from said predetermined destination; and

analysing the delay occurred in order to determine the load on said network.

REMARKS

This preliminary amendment is presented to eliminate multiple dependency from the present claims. No new matter has been added. Early examination and favorable consideration of the above-identified application is earnestly solicited.

Any additional fees or charges required at this time in connection with the application may be charged to our Patent and Trademark Office Deposit Account No. 03-2412.

Respectfully submitted,
COHEN, PONTANI, LIEBERMAN & PAVANE

By: _____

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15 November 2001

AMENDMENTS TO THE SPECIFICATION AND CLAIMS SHOWING CHANGES

In the Claims:

3. The interface establishing device according to claim 1 [or 2], characterized in that said control means (32) is adapted to send a test packet to a predetermined destination over said network (4), receive said test packet back from said predetermined destination and analyse the delay occurred in order to determine the load on said network.

6. The method according to claim 4 [or 5]

characterized by further comprising the steps of

sending a test packet to a predetermined destination over said network (4);

receiving said test packet back from said predetermined destination; and

analysing the delay occurred in order to determine the load on said network.

ADAPTIVE RATE MATCHING FOR DATA OR SPEECH

FIELD OF THE INVENTION

The present invention relates to an interface establishing means and a method for transmitting data to and receiving data from a network. In particular, the present invention relates to a gateway between two different networks and a method for operating such a gateway.

BACKGROUND OF THE INVENTION

In recent years, the Voice over IP (VoIP) technology was developed in which a phone call is sent via an IP-based network (IP network, Internet Protocol network) such as the Internet, for example. By sending the signal via such a network instead of a conventional long distance carrier, it is possible to reduce the costs involved for such a call.

A general architecture according to the VoIP technology is shown in Fig. 1. For the purpose of the following description, the left side of the IP network 4 in Fig. 1 is referred to as the near-end side, while the right side is referred to as the far-end side.

A first communication device 1 such as a mobile phone or a fixed phone is connected to a first network control device 2 for controlling a first network (near-end network) to which the mobile phone 1 is connected. The first network control device 2 is, for example, a mobile services switching center (MSC). A speech signal is sent at a bit rate of, e.g., 64 kbps from the first network

control device 2 to a first gateway 3 which connects the near-end network with the IP network 4. The speech signal can be a 64 kbps PCM channel, for example.

In order to achieve capacity saving on the IP link, the speech is compressed in the gateway. This compression is performed by a codec (coder-decoder, transcoder, code converter) arranged in the first gateway 3. A typical compression ratio for speech is, for example, 8:1. Since the function of the codec itself is not important to the present invention, a detailed description thereof is omitted here.

The speech signal is compressed, for example, to a bit rate of 8 kbps. The compressed speech signal is sent via the IP network 4 to a second gateway 5. This second gateway also comprises a codec (coder-decoder). However, this codec decompresses the compressed signal received from the IP network 4 to restore the original rate (i.e., in the above example, 64 kbps). The decompressed speech signal is sent to a second network control device 6 for controlling a second network (far-end network) to which a phone 7 as a second communication device is connected. The second network control device 6 can be a mobile services switching center (MSC) in case the phone 7 is a mobile phone or a fixed services switching center (FSC) in case the phone 7 is a fixed phone. The second network control device 6 sends the signal to the destination phone 7.

As described above, the speech signal is compressed and decompressed. In case of a speech signal, this can be effected by using a codec, as described above. The compression serves to save capacity in the IP network.

Furthermore, by compressing the signal, the transmission is not so sensitive to dropped and/or delayed packets as in the case of a non-compressed transmission.

Fax and dial-up modems use the same 64 kbps PCM signal as the speech signal does. If such signals (in the following referred to as modem signals) would be processed in the same way as the speech signal (i.e., transmitted via the codec), the modem connections could be blocked completely. For this reason, the gateways 3 and 5 also comprise modems to handle such signals.

In the above situation, high load and even congestion in the IP network is likely to happen, since, for example, the IP network capacity is not overdimensioned in great extent. This will be in particular a problem in case of a further application of the IP telephony in general.

In this situation, any delay caused by the congestion should be minimised. Thus, there is no time for retransmissions of lost packets. Therefore, the UDP (User Datagram Protocol) is commonly used instead of TCP (Transmission Control Protocol). UDP is a rather simple protocol and has a minimum protocol handling. According to this protocol, everything received from the application is sent via the network without any complicated checks. Furthermore, no check is performed whether all data packets have been received by the destination. Thus, this protocol provides a fast, but not very safe transmission.

On the other hand, TCP includes a flow control mechanism. Therefore, this protocol is safer than UDP but requires more protocol handling and more time. This results in a

higher data amount required for the handling of the protocol.

In case of an overload or a congestion, UDP is not capable to detect whether any failure in the transmission have occurred. Moreover, in case of a congestion the situation in the IP network is worsen by UDP since the data packets are transferred via the network with a constant rate.

In order to make the transmission safer when using UDP, the receiving end can send back in its payloads the information received, such that it can be checked whether the data have been received safely. Alternatively, the UDP could be provided with an acknowledge mechanism like RTCP (Real Time Control Protocol) messages. However, these possibilities both lead to a higher amount of data to be sent via the network, which worsens the congestion situation.

Thus, by using the conventional techniques, in case of an overload and congestion of the network, the transmission quality is decreased since packets are delayed or even get lost.

Document EP-A-0 790 725, forming prior art as described in the preambles of claims 1 and 4, discloses an ATM transmission system with a variable transmission rate. The sending rate of a transmitter 14 is decreased when a discard of cells, i.e., a loss of data packets occurs.

The article "A Dynamic Rate Control Mechanism for Integrated Networks" by Nanying Yin et al, Network In The Nineties, Bal harbour, Apr. 7-11, 1991, Vol. 2, Nr. Conf. 10, pages 543 - 552, IEEE, describes a control by which the source coding rate is adjusted based on network feedback information.

Furthermore, also congestion of a network is detected, and in case of congestion in the network, the rate is decreased.

Moreover, document EP-A-0 782 302 describes a method and apparatus for controlling data transfer rates of sources in ATM networks. In particular, according to this document the transfer rates of a plurality of data sources are controlled on the basis of a detected congestion state.

SUMMARY OF THE INVENTION

The object underlying this invention resides in removing the above drawbacks and to enable a sufficient transmission quality even in case of congestion of a network.

This object is solved by an interface establishing device for transmitting data to and receiving data from a network, comprising a transceiver means being operable with variable transfer rates, a detecting means for detecting the load upon said network, and a control means for adjusting the transfer rate of said transceiver means in response to the detected load, characterized in that said transceiver means comprise a plurality of transceiver means, and said control means is adapted to provide each of said plurality of transceiver means with different priorities and to adjust a transfer rate of a transceiver means with a higher priority on a higher value than the transfer rate of a transceiver means with a lower priority, wherein said transceiver means comprise a modem for modulating and demodulating of non-speech data and a codec for encoding and decoding of speech data, wherein said control means is adapted to provide said codec with a higher priority than the modem.

Alternatively, the above object is achieved by a method for transmitting data to and receiving data from a network, comprising the steps of detecting the load on said network, and adjusting a transfer rate of a transceiver means in response to said detected load, characterized in that said transceiver means comprise a plurality of transceiver means, the method further comprising the steps of providing different priorities for each of said plurality of transceiver means and adjusting a transfer rate of a transceiver means with a higher priority on a higher value than the transfer rate of a transceiver means with a lower priority, wherein said transceiver means comprises a modem for modulating and demodulating of non-speech data and a codec for encoding and decoding of speech data, and said codec is provided with a higher priority than the modem.

Thus, it is possible to adapt the transfer rate of a modem or a codec in response to the load or congestion of a network.

That is, in the interface establishing device (gateway) and method for transmitting data to and receiving data from a network according to the present invention, the transfer rate (data rate) can be adapted to the present load on the network. That is, in case a congestion occurs, the transfer rate can be set on a lower value such that data packets can be safely transmitted via the network.

Thus, the transmission quality can be maintained on a sufficient level, since no packet delay or even losses can occur. Only the bandwidth of the speech signal is slightly reduced due to the decreased transfer rate. That is, the speech quality might be reduced slightly, but the end-to-end link stays at least available.

Furthermore, by using the device and the method according to the present invention, it is possible for the IP network to recover faster from a congestion. This is because the transfer rate, i.e., the data amount transmitted per time unit is reduced, such that the load on the network is decreased.

Further advantageous developments of the present invention are stated in the enclosed dependent claims.

BRIEF DESCRIPTION OF THE DRAWINGS

The present invention will be more readily understood with reference to the accompanying drawings in which:

Fig. 1 shows the basic structure of the VoIP technique;

Fig. 2 shows a gateway according to an embodiment of the present invention; and

Fig. 3 shows a process carried out in the gateway according to the embodiment of the invention.

DETAILED DESCRIPTION OF PREFERRED EMBODIMENTS

The idea of the present invention is to use the congestion indication (or load indication), which is available from the flow control information (e.g., for example from RCTP reports) to control the modem and/or codec transfer rate adaptively. That is, the transfer rate is controlled in such a manner that it is reduced in case a congestion is present and packets get lost and

that it is increased in case no congestion is present and all packets are safely received.

In the following, an embodiment of the invention is described with reference to Figs. 2 and 3.

In Fig. 2, a gateway 3 according to the present embodiment is shown which can be used in the basic VoIP architecture illustrated in Fig. 1. As shown, the gateway 3 comprises a modem 31, a codec 33 and a flow controller 34.

The modem 31 serves to compress and decompress fax and/or modem signals TE_M which are transferred to the side of a user terminal. The modem 31 is capable of transmitting with a plurality of different predetermined transfer rates (data rates). For example, the modem could provide transfer rates of 56 kbps, 33 kbps, 28 kbps and 9 kbps. The different rates can be selected by a modem control signal CS_M. The output signal (IP_M) is transferred to the IP network 4 via a flow controller 34.

The codec 33 serves to compress and decompress speech signals TE_D which are transferred to the side of a user terminal (in the configuration of Fig. 1, the phone 1). As the modem 31, the codec 33 is capable of transmitting with a plurality of different predetermined transfer rates (data rates). For example, the codec could provide transfer rates of 64 kbps, 32 kbps, 16 kbps, 8 kbps and 4 kbps. The different transfer rates can be selected by a codec control signal CS_C. The output signal (IP_C) is transferred to the IP network 4 via the flow controller 34.

The flow controller 34 serves basically to control the data stream sent to and received from the IP network 4. According to the present embodiment, the flow controller 34 also serves to detect the load on the network. The detection can be effected, for example, by using RTCP reports. For example, the (proprietary) RTP/TCP payloads can be used to transfer the number of transmitted/received packets between the gateways 3 and 5.

Furthermore, the load can be detected by monitoring Frame Relay's Forward/Backward Explicit Congestion Notification (FECN/BECN) bits, ATM (Asynchronous transfer mode) reports etc.

Moreover, a test packet, for example, an IP PING packet can be sent via the IP network 4 to a predetermined destination, for example to the gateway 5, and then received back from this destination. The occurred delay (round-trip delay) can than be analysed. By such an analysis, a delay can be measured. If this delay suddenly increases from an initially measured level, this indicates a congestion.

The flow controller 34 transmits corresponding detection signals to a mode/rate selector 32. According to this detection result, the mode/rate selector 32 sets (adjusts) the transfer rate of the modem 31 and the codec 33. For example, the mode/rate selector 32 sets the rate for the codec 33 according to the detected load on the network on 64 kbps PCM, GSM Full Rate (16 kbps) or GSM Half Rate (8kbps). On the other hand, in case of a modem

call this information can be used to adjust the maximum transfer rate of the modem 31.

Furthermore, this information can also serve to adjust the maximum transfer rate between a users modem (which can be arranged in the phone 1 according to Fig. 1, for example) and the modem 31 in the gateway 3 in range of 33,6 kbps, 28,8 kbps, 14,4 kbps and 9,6 kbps by commanding the modem 31. Hence, the amount of data coming from the user towards the IP network 4 can be controlled according to this embodiment.

Fig. 3 shows a flow chart in which a process according to the present embodiment is illustrated.

In step S1, the load on the IP network at present is detected. This information is used in step S2, in which the modem transfer rate for the modem 31 and the codec transfer rate for the codec 33 are selected. In step S3, the modem transfer rate determined in this manner is set in the modem 31. Furthermore, in step S4 the determined codec transfer rate is set in the codec 33.

Thus, the transfer rate of the modem 31 and/or the codec 33 (which are examples for a transceiver means) can be adapted to the load and the congestion on the IP network.

In the above described embodiment, the modem and the codec have been described as comprising a plurality of different, predetermined transfer rates. However, preferably the transfer rate can be freely (i.e., continuously) adjusted. The more modes (rates) in the modem/codec are, the smoother the transfer rates can be adapted to the load generated in the IP network. Thus,

preferably, a variable bit rate speech codec like an Adaptive Multi Rate (AMR) codec could be used for speech.

In the following, a second embodiment is described, which is a modification of the first embodiment. According to the first embodiment, fixed predetermined transfer rates are set in response to the detected load on the network for both the codec 33 and the modem 31 in the same way. However, it is possible that a lot of non-speech data like fax signals are transmitted via the modem. In this case, a high transmission quality in terms of speed is not as important as in speech signals, since a delay of data packets relating to a fax transmission only lengthens the time of transmission. In contrast thereto, delay of data packets relating to a speech transmission affect the speech quality greatly.

Thus, according to this embodiment, the transfer via the modem and via the codec are provided with different priorities. That is, in case of an overload or congestion of the IP network, the codec 31 gets a higher transfer rate since the codec mainly transfers speech signals. On the other hand, the modem 33 gets a lower transfer rate since the modem transfers also non-speech signals.

Moreover, as a further modification of the above described embodiments, it is also possible to simplify the detection performed by the flow controller 34. Namely, it can be assumed that the load on the IP network does not change abruptly. Thus, it can be sufficient to perform the detection only once in a predetermined period, for example, in every five minutes. For this, a timer can be inserted in the flow controller 34 which outputs an interrupt at the desired time point. In

response to this interrupt, the flow controller 34 performs the process as described with respect to Fig. 3.

Hence, the flow controller 34 does not always have to perform the detection and can be used for other operations.

The above description and accompanying drawings only illustrate the present invention by way of example. Thus, the embodiments of the invention may vary within the scope of the attached claims.

Enclosure of August 2, 2001

PCT Patent Application No.: PCT/EP99/03516
NOKIA NETWORKS OY
Our ref.: WO 23919

New claims 1 to 6

1. An interface establishing device for transmitting data to and receiving data from a network (**4**), comprising

a transceiver means (**31, 33**) being operable with variable transfer rates,

a detecting means (**34**) for detecting the load upon said network (**4**), and

a control means (**32**) for adjusting the transfer rate of said transceiver means (**31, 33**) in response to the detected load,

characterized in that

said transceiver means comprise a plurality of transceiver means, and said control means (**32**) is adapted to provide each of said plurality of transceiver means (**31, 33**) with different priorities and to adjust a transfer rate of a transceiver means (**33**) with a higher priority on a higher value than the transfer rate of a transceiver means (**31**) with a lower priority, wherein

said transceiver means comprise a modem (**31**) for modulating and demodulating of non-speech data (**TE_M, IP_M**) and a codec (**33**) for encoding and decoding of speech data (**TE_C, IP_C**), wherein said control means (**32**) is adapted to provide said codec (**33**) with a higher priority than the modem (**31**).

2. The interface establishing device according to claim 1, **characterized in that** said transceiver means (**31, 33**) comprise a plurality of predetermined transfer rates and said control means (**32**) is adapted to select one of said predetermined transfer rates in response to said detected load.

3. The interface establishing device according to claim 1 or 2, **characterized in that** said control means (**32**) is adapted to send a test packet to a predetermined destination over said network (**4**), receive said test packet back from said predetermined destination and analyse the delay occurred in order to determine the load on said network.

4. A method for transmitting data to and receiving data from a network (**4**), comprising the steps of

detecting (**S1**) the load on said network (**4**), and

adjusting (**S2, S3, S4**) a transfer rate of a transceiver means (**31, 33**) in response to said detected load,

characterized in that

said transceiver means comprise a plurality of transceiver means, the method further comprising the steps of

providing different priorities for each of said plurality of transceiver means (**31, 33**) and adjusting a transfer rate of a transceiver means (**33**) with a higher priority on a higher value than the transfer rate of a transceiver means (**31**) with a lower priority, wherein

said transceiver means comprises a modem (**31**) for modulating and demodulating of non-speech data (**TE_M, IP_M**) and a codec (**33**) for encoding and decoding of

speech data (**TE_C**, **IP_C**), and said codec (**33**) is provided with a higher priority than the modem (**31**).

5. The method according to claim 4, **characterized in that** in said transceiver means (**31**, **33**) comprise a plurality of predetermined transfer rates and in said adjusting step (**S2**, **S3**, **S4**) one of said predetermined transfer rates is selected in response to said detected load.

6. The method according to claim 4 or 5 **characterized by** further comprising the steps of sending a test packet to a predetermined destination over said network (**4**); receiving said test packet back from said predetermined destination; and analysing the delay occurred in order to determine the load on said network.

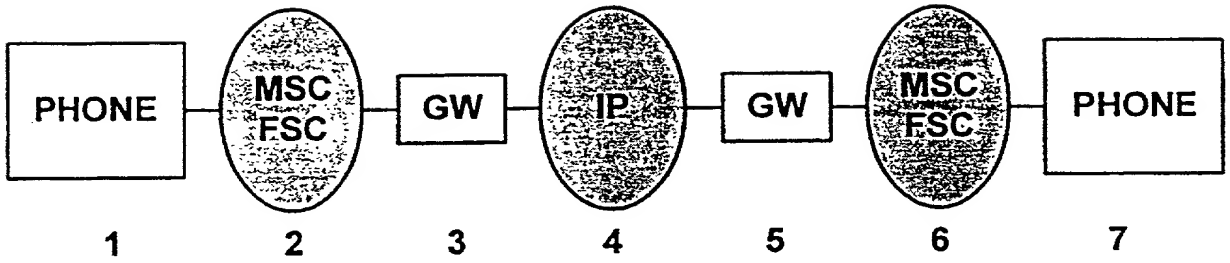
PHONE
MSC FSC
GW
IP
GW
MSC FSC
PHONE
1
2
3
4
5
6
7

FIG. 1

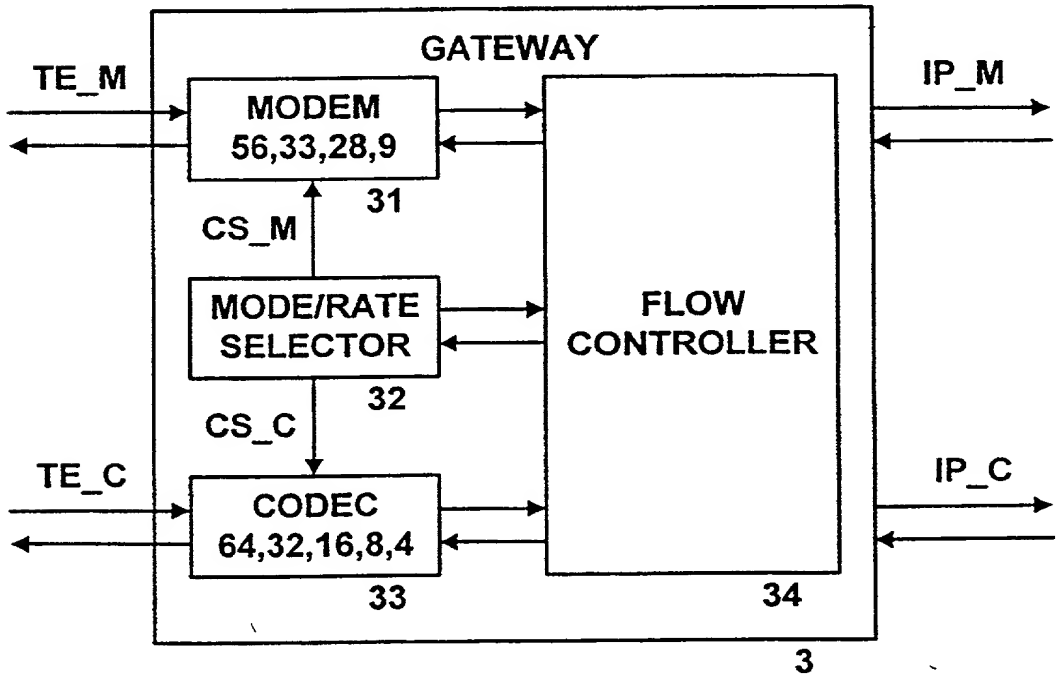
GATEWAY
TE_M
MODEM 56,33,28,9
31
CS_M
MODE/RATE SELECTOR
32
CS_C
TE_C
CODEC 64,32,16,8,4
33
FLOW CONTROLLER
34
IP_M
IP_C
3

FIG. 2

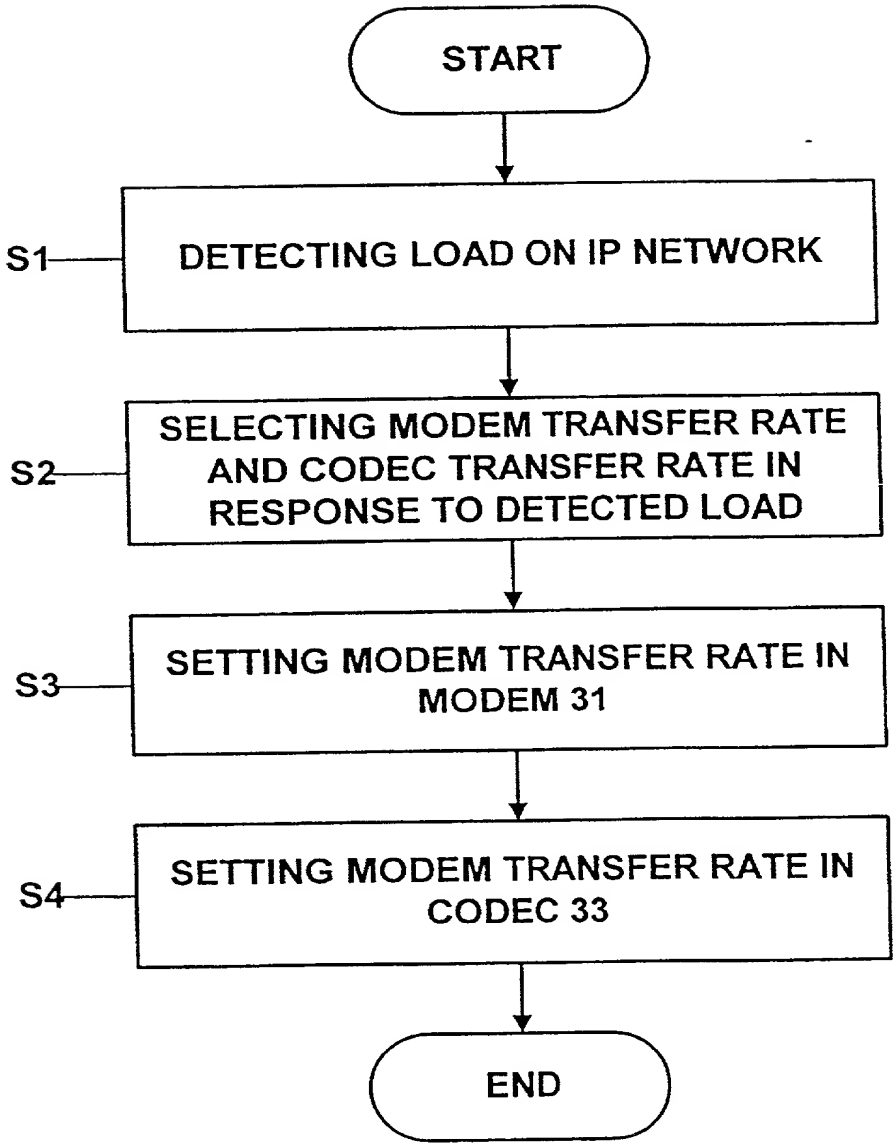
START
S1
DETECTING LOAD ON IP NETWORK
S2
SELECTING MODEM TRANSFER RATE AND CODEC TRANSFER RATE IN RESPONSE TO DETECTED LOAD
S3
SETTING MODEM TRANSFER RATE IN MODEM 31
S4
SETTING MODEM TRANSFER RATE IN CODEC 33
END

FIG. 3

COMBINED DECLARATION FOR PATENT APPLICATION AND POWER OF ATTORNEY Includes Reference to PCT International Applications	Attorney's Docket No.**4925-161PUS**

As a below named inventor, I hereby declare that:

My residence, post office address and citizenship are as stated below next to my name.

I believe I am the original, first and sole inventor (if only one name is listed below) or an original, first and joint inventor (if plural names are listed below) of the subject matter which is claimed and for which a patent is sought on the invention entitled:

ADAPTIVE RATE MATCHING FOR DATA OR SPEECH

the specification of which (check only one item below)

[] is attached hereto

[] was filed as United States application

Serial No. _

on _

and was amended

on _ (if applicable).

[x] was filed as PCT international application

Number PCT/EP99/03516

on May 21, 2000

and was amended under PCT Article 19

on _ (if applicable).

I hereby state that I have reviewed and understand the contents of the above-identified specification, including the claims, as amended by any amendment referred to above.

I acknowledge the duty to disclose information which is material to the patentability of the application in accordance with Title 37, Code of Federal Regulations, §1.56(a).

I hereby claim foreign priority benefits under Title 35, United States Code, §119 of any foreign application(s) for patent or inventor's certificate or of any PCT international application(s) designating at least one country other than the United States of America listed below and have also identified below any foreign application(s) for patent or inventor's certificate or any PCT international application(s) designating at least one country other than the United States of America filed by me on the same subject matter having a filing date before that of the application(s) of which priority is claimed.

PRIOR FOREIGN/PCT APPLICATIONS AND ANY PRIORITY CLAIMS UNDER 35 U.S.C. 119:

Country (if PCT, indicate "PCT")	Application Number	Date of Filing (day, month, year)	Priority Claimed Under 35 U.S.C. 119	
			[] YES	[] NO
PCT	PCT/EP99/03516	May 21, 2000	[x] YES	[] NO
			[] YES	[] NO
			[] YES	[] NO
			[] YES	[] NO
			[] YES	[] NO
			[] YES	[] NO

Combined Declaration for Patent Application and Power of Attorney (Continued) (Includes Reference to PCT International Applications)	Attorney's Docket No. **4925-161PUS**

I hereby claim the benefit under Title 35, United States Code, §120 of any United States application(s) or PCT international application(s) designating the United States of America that is/are listed below and, insofar as the subject matter of each of the claims of this application is not disclosed in that/those prior application(s) in the manner provided by the first paragraph of Title 35, United States Code, §112, I acknowledge the duty to disclose material information as defined in Title 37, Code of Federal Regulations, §1.56(a) which occurred between the filing date of the prior application(s) and the national or PCT international filing date of this application:

PRIOR U.S. APPLICATIONS OR PCT INTERNATIONAL APPLICATIONS DESIGNATING THE U.S. FOR BENEFIT UNDER 35 U.S.C. 120:

U.S. APPLICATIONS		STATUS *(check one)*		
U S. APPLICATION NUMBER	U.S. FILING DATE	PATENTED	PENDING	ABANDONED

PCT APPLICATIONS DESIGNATING THE U.S.					
PCT APPLICATION NO	PCT FILING DATE	U.S. SERIAL NUMBERS ASSIGNED *(if any)*			
PCT/EP99/03516	May 21, 2000			x	

POWER OF ATTORNEY: As a named inventor, I hereby appoint the following attorney(s) and/or agent(s) to prosecute this application and transact all business in the Patent and Trademark Office connected therewith (*List name and registration number*)

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Combined Declaration for Patent Application and Power of Attorney (Continued) (Includes Reference to PCT International Applications)				Attorney's Docket No. 4925-161PUS
203	FULL NAME OF INVENTOR	FAMILY NAME	FIRST GIVEN NAME	SECOND GIVEN NAME
	RESIDENCE, CITIZENSHIP	CITY	STATE OR FOREIGN COUNTRY	COUNTRY OF CITIZENSHIP
	POST OFFICE ADDRESS	POST OFFICE ADDRESS	CITY	STATE & ZIP CODE/COUNTRY

I hereby declare that all statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true; and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under §1001 of Title 18 of the United States Code and that such willful false statements may jeopardize the validity of the application or any patent issuing thereon.

SIGNATURE OF INVENTOR 201	SIGNATURE OF INVENTOR 202	SIGNATURE OF INVENTOR 203
DATE 21.12 2001	DATE	DATE